AP Statistics Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Activity for after Unit 4 Exam Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Get a partner.

The data you have been given is from a senior class from a large high school. It lists the sex, Math score, and Verbal score of each senior that took the SAT exam.

**Average Math Score**

1. With your partner create a random sample of 5 students. (Use the calculator to select the sample. randint(1,303), no repeats)
2. Record the Math scores.
3. Find the average of the 5 Math scores. 
4. Find 4 more samples and calculate the mean Math scores.



1. Put your scores on the white board along with the other groups.
2. Put the data in the calculator and create a histogram.



1. Find the mean and standard deviation of the data and describe the histogram.
2. On the graph above mark where the mean is and ±1,2,and 3 standard deviations from the mean. Draw in vertical lines for these values
3. What percent of the samples fell within 1 standard deviations of the mean? What percent of the samples fell within 2 standard deviations of the mean? *It may help to order the data. In the calculator hit STAT->2:SortA( and enter the list L1*
4. Assuming that the distribution is Normally distributed how did the percents in #9 compare to what we expect?

**Increasing sample size.**

1. With your partner create a random sample of 25 students. (Use the calculator to select the sample. randint(1,303), no repeats)
2. Record the Math scores.
3. Find the average of the 25 Math scores. 
4. Find 4 more samples and calculate the mean Math scores.



1. Put your scores on the white board along with the other groups.
2. Put the data in the calculator and create a histogram.



1. Find the mean and standard deviation of the data and describe the histogram.

1. Compare the mean, standard deviation, and shape of the two histograms (#6 and #16)
2. What can you conclude about how increasing the sample size changes the distribution (of sample means)?
3. How likely would it be for you to get an average of 520 if you had a sample size of 5? a sample size of 25? Use both histograms you created to help answer this.

**Proportion of Males?**

It has been suggested that males are not taking the SAT as much as the females. We are interested in seeing if the proportion of males that took the test is less than the proportion of females that took the test. Suppose we know that in the school (the population), 50% are male and 50% are female. Let’s find out if the proportion of males that took the test less than 50%.

1. With your partner take a random sample of 20 students. Calculate the proportion of males by dividing the number of males by 20



1. Find 4 more samples and calculate the proportion of males for each sample.



1. Put all your sample proportions on the board with the rest of the class. Enter the data into the calculator and create a histogram. Draw it below.



1. Calculate the mean and standard deviation for the sample proportions.
2. Based on the histogram, what do you think the true proportion of males that took the test is?
3. From the data, what percent of the class results (the proportions) were less than 50%?
4. How likely is it that the true proportion of males taking the SAT is less than 50%?
5. If we increased the sample size to 30 what do you think would happen to your answers in #4 and #6?